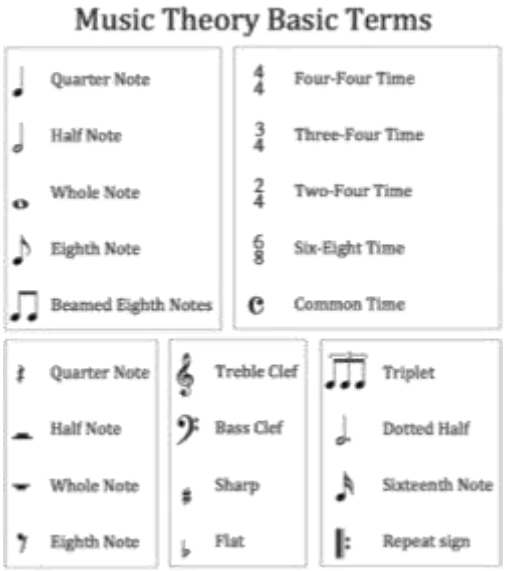
Understanding the Basics of Music Theory

Euterpe



Terpsichore

***A Study of "Music Theory" is necessary to further understand the para-psychology of infantile primeval memories generally associated with psycho-symbolic occult proto-sciences; prerequisite to studies in Artificial Intelligence* (AI).**

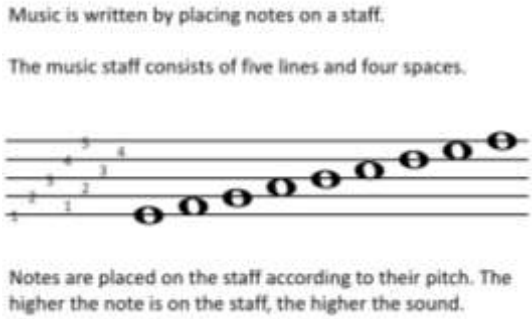
When we say ***music theory***, we *usually* aren't talking about a universal system of understanding music. Rather, we are focusing *specifically* on **Western Tonal Harmonic *music***, or **"*common practice*" *music***. This type of music was developed from 1650-to-1900 in Western Europe. We consider it "common practice" not because it is the only good sounding music, but because it has been ***a widely accepted system of analyzing music*** for three hundred years and is ***the foundation*** for much classical, pop, rock, and some aspects of blues and jazz music.

Music theory is a system of describing, notating, communicating, and analyzing music. It is not a "theory" like the theory of relativity, but rather a framework for understanding many types of music. It does not describe how music should work or what makes music work, but is simply a method by which composers, musicians, educators and anyone else can communicate and understand Western Tonal music.

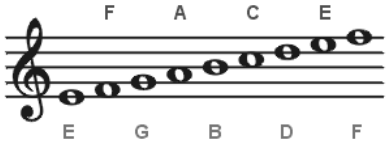
The Staff

The staff is the basis of written music. It is what the notes are presented on. It consists of 5 lines with four spaces between them. A simple, unadorned staff is shown below.

The Staff

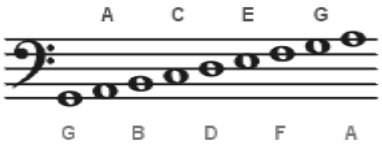


Different pitches are named by letters. The musical alphabet is, in ascending order by pitch, A, B, C, D, E, F and G. After G, the cycle repeats going back to A. Each line and space on the staff represents a different pitch: The lower on the staff, the lower the pitch of the note. Notes are represented by little ovals on the staff. Depending on the clef (***discussed below***), the position of each note on the staff corresponds to a letter name.



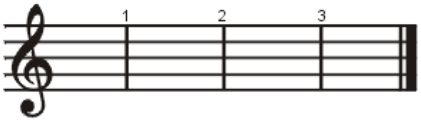
Treble Clef

This is the **treble staff**. The treble clef (*the large fancy symbol to the far left*) shows the musician that the staff is treble. Since it curls around the **"G"** line, it is also called a **"*G clef*."** The treble staff begins with the first line as **"E."** Each successive space and line is the next letter in the musical alphabet. The staff ends with the last line as an **"F."** Many **mnemonic devices** exist to help a person remember which line and space is which. One of the most common phrases to remember the names of the lines is: ***Every Good Boy Does Fine***. (Also popular is ***Elvis' Guitar Broke Down Friday***). To remember the spaces, just remember that they spell **FACE** starting from the bottom.



Bass Clef

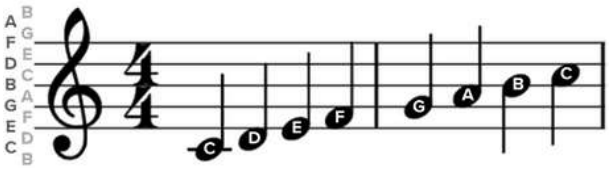
This is the bass (pronounced 'base') staff. The **bass clef**, *also known as* the **"F clef"** because it locates the line known as F, is on the far left. The bass clef uses the same musical alphabet as treble, but the letters start in different places. Instead of an E, the bottom line is a G, and the letters proceed logically from there. Again, simple mnemonics can be used to remember the names of the notes. The lines on the bass cleft, from bottom to top are: G, B, D, F, A (***Good Boys Don't Fight Anyone***), and the spaces are A,C,E,G (***All Cows Eat Grass***).



The Measures

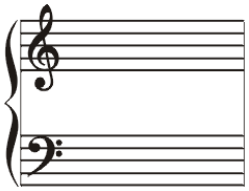
The vertical lines on the staff mark the measures. Measures are used to divide and organize music. The time signature determines how many beats can be in a measure. The thick double bars mark the beginning and ends of a piece of music. Measures are sometimes marked with numbers to make navigating a piece easier. The first measure would be measure one, the second measure two and so on.

To find out the pitch of a written note, you look at the ***clef*** and the ***key signature***, then see what line or space the note is on. **The higher a note sits on the staff, the higher it sounds.** To find out the duration of the written note, you look at the ***tempo*** and the ***time signature*** and then see what the note looks like.



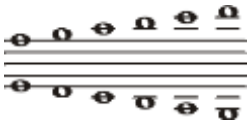
The "C" Scale

This is a **"C clef."** The C clef can move on the staff, and the center of the symbol is always over middle C. Depending on where it is, it is given different names. The note beside each clef is middle C. These clefs are used very infrequently.



The Grand Staff

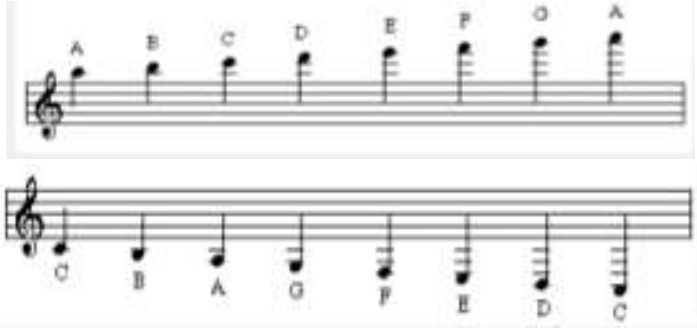
When the bass and treble clef are combined and connected by ***a brace* (*left*)** and lines, they become the grand staff. This greatly increases the range of pitches that can be noted, and is often used in piano music, due to the piano's wide range (*q.v.*).



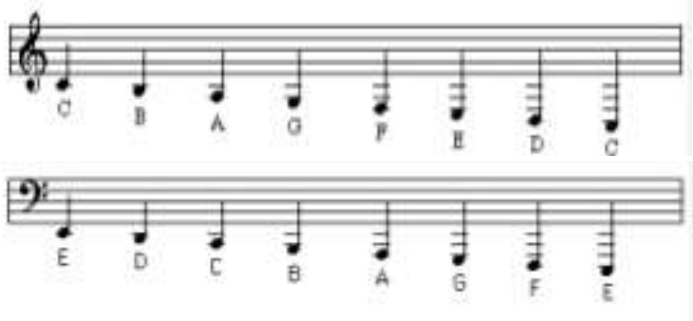
Ledger Lines

Ledger lines extend above and below the staff, allowing for higher or lower notes to be shown than would otherwise fit on the staff. These lines follow the same musical alphabet pattern as the staff does. Think of them as just extra lines and spaces on the end of the staff.

The stems of notes on ledger lines extend either up or down towards the middle line.



Treble Stave Ledger Lines



Bass Stave Ledger Lines

Beats and Measures

Because music is heard over a period of time, one of the main ways music is organized is by dividing that time up into short periods called ***beats***. In most music, things tend to happen right at the beginning of each beat. This makes the beat easy to hear and feel. When you clap your hands, tap your toes, or dance, you are "moving to the beat." Your claps are sounding at the beginning of the beat, *too*. This is also called being "on the downbeat," because it is the time when the conductor's baton hits the bottom of its path and starts moving up again.

Conducting also depends on the meter of the piece; conductors use different conducting patterns for the different meters. These patterns emphasize the differences between the stronger and weaker beats to help the performers keep track of where they are in the music.

Maestro Carlos Kleiber: A Conductor Unlike Any Other
24-25 July 1972, Stuttgart; Stuttgart Radio Symphony Orchestra; Wagner Rehearsal

But the conducting patterns depend only on the pattern of strong and weak beats. In other words, they only depend on "how many beats there are in a measure," not "what type of note gets a beat." So even though the time signature is often called the "meter" of a piece, one can talk about meter without worrying about the time signature or even being able to read music.

Whether you're a dancer, a musician, or just a music-lover, you know that rhythm is an important foundation of any song, and you've probably heard the term beat. A beat is the basic unit of rhythm, the underlying steady pulse of the song, the part that makes you tap your feet. With a little practice and a basic knowledge of music theory, anyone can learn to find and count beats in a piece of music.

Know your rhythms.

Before you can begin to count in music, you need to understand how long an individual note or rest lasts. Notes are the periods of sound in a song, and rests represent the lengths of the silences in a piece of music.

A ***whole note*** lasts for 4 beats. A half note lasts for 2 beats. A quarter note lasts for 1 beat. An eighth note lasts for a half of a beat. A sixteenth note lasts for a quarter of a beat.

Rests follow the patterns of the notes. For example, a half rest is a silence that lasts for 2 beats.

A dot next to a rest or a note means that the note or rest is increased by half its value. For example, a dotted half note lasts for 3 beats.

Tempo

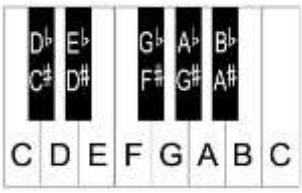
The tempo of a piece of music is its speed. There are two ways to specify a tempo. Metronome markings are absolute and specific. Other tempo markings are verbal descriptions which are more relative and subjective. Both types of markings usually appear above the staff, at the beginning of the piece, and then at any spot where the tempo changes. Markings that ask the player to deviate slightly from the main tempo, such as ***ritardando*** may appear either above or below the staff.

Pitch

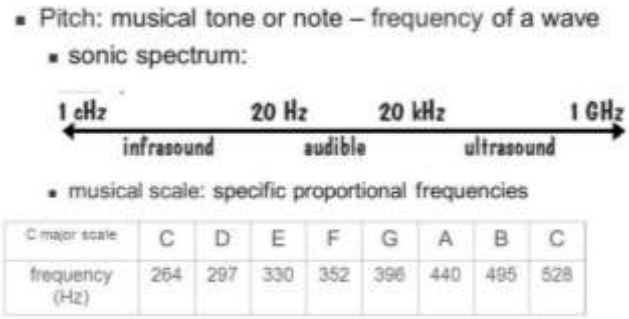
All music is based on sound and when we refer to ***a specific tone*** we are referring to a ***pitch***. Every key on a piano plays a different pitch. In traditional western music, we focus on ***twelve pitches*** to make music. They are as follows:

C • C♯/D ♭ • D • D♯/E ♭ • E • F • F♯/G ♭ • G • G♯/A ♭ • A • A♯/B ♭ • B.

It may be helpful to picture a piano keyboard (*illustrated below*):



Piano Keyboard Basics



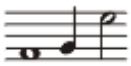
Sound Wave Frequencies

If you've seen a piano before, you'll notice that after we get to B, the whole thing just starts over again. Normally, ***there are eight C-keys on a piano***. Each of those keys plays the same sound (in this case, the tone C) but higher or lower depending on the key. Therefore, we would say that the eight C-keys on a piano are the same pitch class but different pitches.

If you consult our pitches above, it may appear that ***seventeen notes*** have been listed, but this list *actually* only contains ***twelve notes***. The notes with a slash between them are **enharmonic**, meaning *that* they represent ***the same pitch with two different names***. For example, C♯ (C sharp) and D ♭ (D flat) are actually the same. To see this, these notes both get played by the same black key on a piano.

Notes

Different pitches are named by letters. The musical alphabet is, in ascending order by pitch, A, B, C, D, E, F and G. After G, the cycle repeats going back to A. Each line and space on the staff represents a different pitch. The lower on the staff, the lower the pitch of the note. Notes are represented by little ovals on the staff. Depending on the clef (discussed below), the position of each note on the staff corresponds to a letter name.



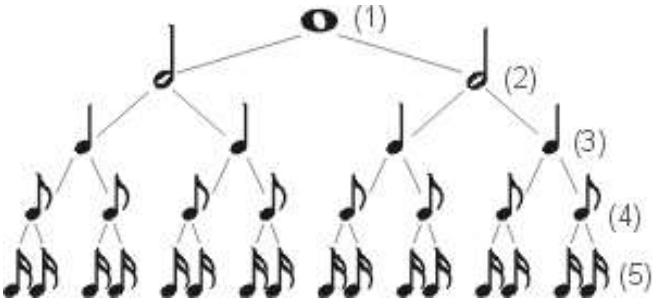
Notes are centered on the lines or in the spaces between the lines. Stems on notes above the middle line trail down from the left of the note. Stems on notes below the middle line stick up on the right of the note. Stems on notes on the line usually go down except when adjacent notes have flags that go up. Note stems are usually one octave (eight successive lines and spaces) long. When two melodies occupy the same staff, the stems for the notes in one melody are written up and the stems for notes in the other are written down.

Note Lengths in written music: The Shape of a Note

In ***standard notation***, a ***single musical sound*** is written as ***a note***. The two most important things a written piece of music needs to tell you about a note are its ***pitch*** - how high or low it is - and its ***duration*** - how long it lasts.

Note Durations

All notes have length. However, the number of beats they get depends on the time signature, so only relative note durations will be discussed here.

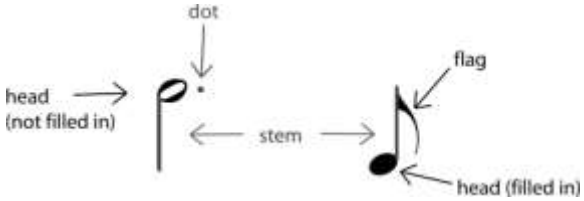


This graphic shows a hierarchy of note values.

At the top is a whole note (1).
A half note is half the duration of a whole note, so a whole note is as long as two half notes (2).
Likewise, a half note is as long as two quarter notes (3).
A quarter note is as long as two eighth notes (4), and an eighth note is as long as two sixteenth notes (5).

Sixteenth notes (right) and eighth notes (left) may also look like this. Single sixteenth and eighth notes have flags, many sixteenth and eighth notes combine flags into connecting bars.

Sixteenth notes and eighth notes may also combine together. the combination looks like this picture above left.

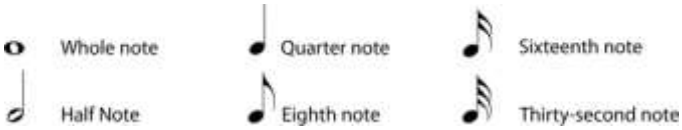


The Parts of a Note *using two different notes.*

All of the parts of a written note affect how long it lasts.

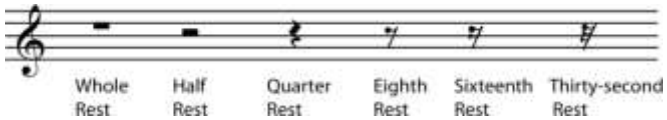
The pitch of the note depends only on what line or space the head of the note is on: (*See* ***pitch***, ***clef*** *and* ***key signature*** *for more information*). *If the note does not have a head that means that it does not have one definite pitch.*

The ***head of the note*** may be filled in (black), or not. The note may also have (or not) ***a stem***, one or more ***flags***, ***beams*** connecting it to other notes, or one-or-more ***dots*** following the head of the note. All of these things affect how much time the note is given in the music.



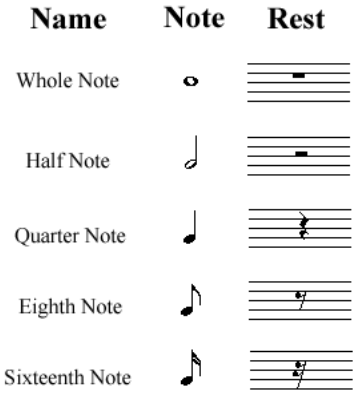
The Most Common Notes

The simplest-looking note, with no stems or flags, is a ***whole note***. All other note lengths are defined by how long they last compared to a whole note. A note that lasts half as long as a whole note is a ***half note***. A note that lasts a quarter as long as a whole note is a ***quarter note***. The pattern continues with eighth notes, sixteenth notes, thirty-second notes, sixty-fourth notes, and so on, each type of note being half the length of the previous type. ***There are no such thing as third notes, sixth notes, ninth notes, tenth notes, etc.***

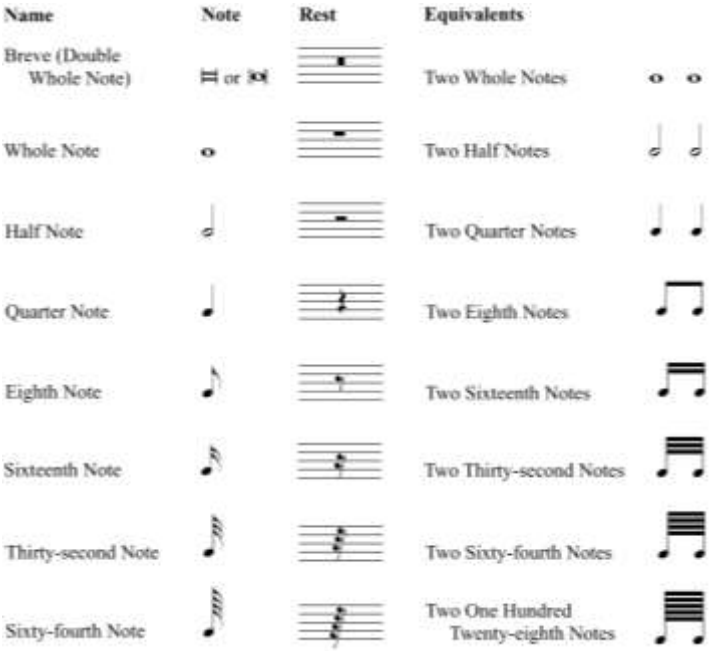


The Most Common Rests

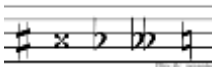
A **rest** stands for ***a silence*** in music. For each kind of note, there is a written rest of the same length.



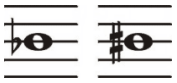
Rests are simply places where the musician does not play. Rests have equivalent values to corresponding notes of duration. Thus, there is a whole rest, half rest, quarter rest, etc., just like normal notes. Rests are always located in the same vertical position.



Accidentals , Ties and Slurs



Accidentals modify the pitch of a note by increasing or decreasing it by one half step. Accidentals stay in effect for all notes of the same pitch for the rest of the measure. When these same symbols appear at the very beginning of the music they are specifying a key signature.



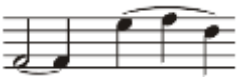
Flats (left side of the picture) lower the pitch of the note by one half step.

Sharps (right side of picture) raise the pitch of the note by one half step.

Naturals cancel out any previous sharps or flats. The pitch returns to normal.

Tied Notes

Ties and slurs connect two or more notes together. Ties connect notes of the same pitch, forming essentially one longer note. Slurs smoothly connect notes of different pitch. This means to play the notes without breaks. The first set of notes above exhibit a tie. The second show a slur.

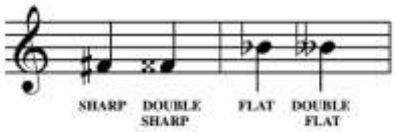


Ties may look like slurs, but they are not the same; a slur connects to notes with different pitches and is a type of articulation.

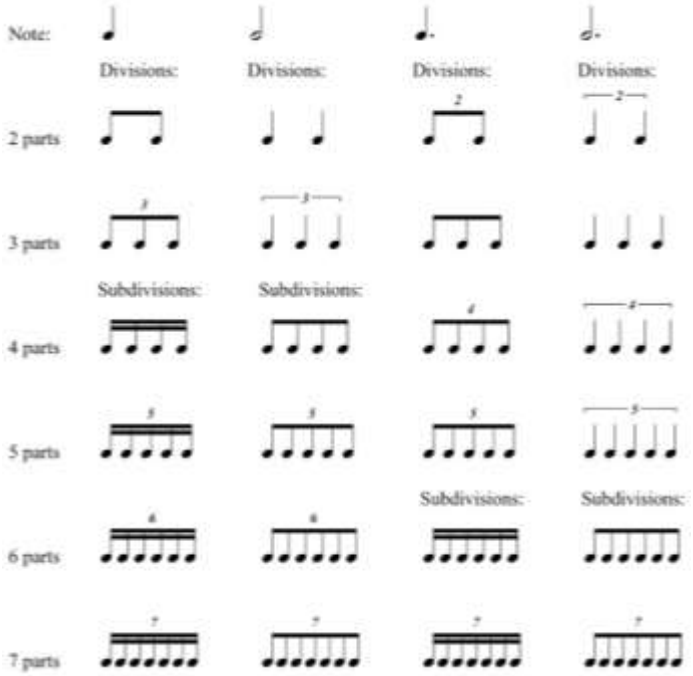
A dotted half lasts as long as a half note plus a quarter note. The same length may be written as a half note and a quarter note tied together. Tied notes are written with a curved line connecting two notes that are on the same line or the same space in the staff. Notes of any length may be tied together, and more than two notes may be tied together. The sound they stand for will be a single note that is the length of all the tied notes added together. This is another way to make a great variety of note lengths. Tied notes are also the only way to write a sound that starts in one measure and ends in a different measure.

Sharp* (♯) *& Flat* (♭) *Notes

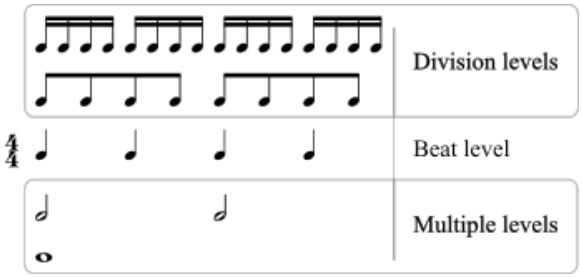
A ***sharp*** is ***one pitch higher*** than the note it is attached to. For instance, F♯ (F sharp) is one pitch higher than F. Inversely, a ***flat*** is ***one pitch lower*** than the note it is attached to. Thus, E ♭ (E flat) is one pitch lower than E. You might be tempted to think that any sharp or flat is the same thing as a black key on the piano, but this is not so. For instance, E♯ is enharmonic with F and C ♭ is enharmonic with B.



While they are not quite as common, there is also a ***double sharp*** **(x)** and a ***double flat*** **(♭ ♭)**. These symbols only mean *that* the tone is ***two pitches higher or lower*** than the note they are attached to. For example, A ♭ ♭ would be enharmonic with G and Dx would be enharmonic with E.



The majority of Western music has emerged from the twelve pitch classes listed above: (C • C♯/D ♭ • D • D♯/E ♭ • E • F • F♯/G ♭ • G • G♯/A ♭ • A • A♯/B ♭ • B). Just about every Western scale and chord (and a great many non-Western scales and chords) are founded from these notes.



Irregular Division of Notes

A note value may be divided and subdivided into any number or equal parts, as shown in the chart below. Those divisions and subdivisions that require added numbers are called irregular divisions and subdivisions.

The Octave

As was briefly mentioned above, all the C-keys on a piano are in the ***same pitch class***, but are ***different pitches***. If you remember, we also said that after we list the twelve pitches, we start over. For example...:

C • C♯/D ♭ • D • D♯/E ♭ • E • F • F♯/G ♭ • G • G♯/A ♭ • A • A♯/B ♭ • B • **C • C♯/D ♭ • D • D♯/E ♭ • E • F** • *and so on...*

If you look at any "C" pitch, what is twelve pitches above it? Another C. What is twelve pitches above that? Yet another C. This distance (of twelve pitches) is called an ***octave***.

Another way to think of it would be that an octave is ***the distance between two consecutive pitches in any pitch class***. So if our pitch class is "C" we might have the following pitches: C1, C2, C3, C4, C5, C6, C7. The distance between C3 and C4 is one octave; the distance between C2 and C5 is three octaves; *etc...*

Intervals

The **octave** is a way of measuring musical distance. The ***distance between any two notes*** is called an ***interval***. There are ***twelve basic intervals*** (*corresponding with the* ***twelve pitches***) but there are two that be particularly important: the ***half step*** **(*semitone*)** and ***whole step*** **(*whole tone*)**. A half step is the distance between two consecutive pitches. For instance, the distance between G and A ♭ , or F and F♯, or B and C. You could think about a piano; ***the distance between any key to the keys immediately next to it*** is ***one half step***. A ***whole step*** is ***two half steps***. So the distance between D and E, or A ♭ and B ♭ or E ♭ and F is one whole step.

These **intervals**, begin at the **Unison** [1] and progress up the octave.

Let us talk briefly about **enharmonics**, for when it comes to intervals they do make a difference. If you started with **C** and wanted a ***minor sixth***, you would go ***up eight half steps*** until you got to **G♯/A ♭ ,** *however*, you wouldn't use the **note G♯**. The distance ***between C and G♯*** is an ***augmented fifth***. If you wanted a minor sixth, you would say ***C to A ♭***. The difference here is, *again*, written but not ***aural***.

There is no discernible change from an augmented fifth or a minor sixth, but for our analytical purposes, it is a very important distinction.

Gene Palma

Gene Palma was a street drummer based in New York during the 1970's and 1980's, famous for his slick black hair and heavy makeup use, and also for his drumming routine that included several different styles—even though ***Gene Krupa*** was his favorite drummer of all time. He could use not only a minor drum, he could also perform with objects on the streets hitting his stick with precision and ability. Film lovers will remember him best for his minor yet unforgettable performance in ***Taxi Driver*** **(1976)** while Travis Bickle is having a date with Betsy in the classic film directed by ***Martin Scorsese***. *He continued his work on the streets for quite some time and even appeared (uncredited) in another film* ***Hero at Large (1980)****, again playing* ***a street drummer***.

Compound Intervals and Jazz

There is a system of naming ***notes past the octave***, used commonly in jazz but *also* to an extent in ***modern classical*** and ***pop music***, called ***compound intervals***. These are *essentially* the same as the basic intervals, but ***expanded by an octave*** **(*12 semitones*)**. Our naming and notational conventions carry over, but we add seven to the note number. For example, a ***minor sixth*** (8 semitones) goes ***up an octave*** to become a ***minor thirteenth*** (now 20 semitones). Where we notate it before at m6, we now notate with m13.

Again, this system is used mostly in jazz. For now, as we study Western Tonal Harmony, we will use our basic intervals. If you were to see a minor thirteenth in a piece of music, we would simplify and call it a minor sixth.

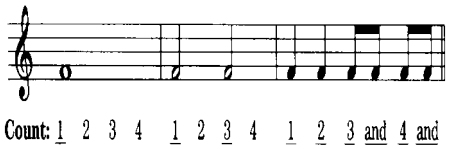
---

[1] In music, **unison** is ***two-or-more musical parts*** sounding the ***same pitch or at an octave interval***, usually ***at the same time***. **Rhythmic patterns** which are ***homorhythmic*** are *also* called ***unison***. In ***orchestral music*** unison can mean ***the simultaneous playing of a note*** (or a series of notes constituting a melody) by different instruments, either at the same pitch; or in a different octave, for example, cello and double bass (*all'unisono*). *Typically, a section string player plays in unison with the rest of the section*.

Occasionally the Italian word ***divisi*** (meaning divided, abbrev. div.) marks a point where an instrumental section, typically the first violins, is ***to be divided into two groups*** for rendering passages that might, for example, include full chords. When several people sing together, as in a ***chorus***, the simplest way for them to sing is to sing in "one voice" (*i.e.*, in unison).

If there is ***an instrument accompanying*** them, then the instrument must play the same notes being sung by the singers (in order for there to be unison). Otherwise the instrument is considered a separate "voice" and there is no unison. If there is no instrument, then the singing is said to be ***a cappella***.

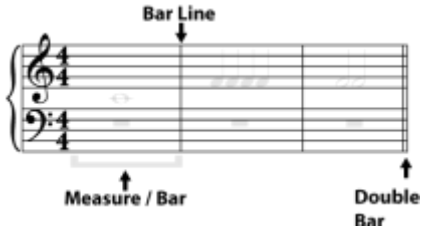
Music in which all the notes sung are in unison is called ***monophonic***. Monophony could also conceivably include more than one voice which do not sing in unison but whose pitches move in parallel, always maintaining the same interval of an octave. A pair of notes sung one or a multiple of an octave apart are almost in unison, due to octave equivalency.



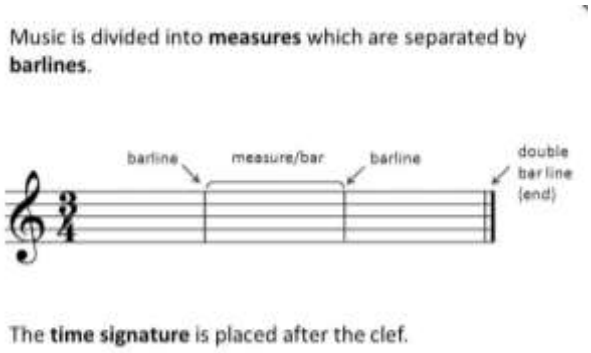
Introduction to Meter & Rhythm

As you listen to most music, you will notice ***a discernible beat***, or ***a primary pulse***. In **common practice music**, we can either ***divide this beat into two parts*** (and multiples of two, such as four), which we call ***simple meters***, or we can divide it into ***three parts*** (and multiples of three, such as six), which we call **compound meter**. When we say we can divide the beat into two or three, all we are saying is that it is easiest to divide the beat into this number. We could arbitrarily divide the beat into five or seven, but ***almost all music naturally divides into two or three***.

Notice all that we have been talking about is how the beats divide. But beats can also be grouped into ***larger sections***. We could place beats into ***groups of two*** (which we call duple), ***three*** (which we call triple), or ***four*** (which we call quadruple). We could place the beats into as large a group as we want, but for now let us stay with **duple/triple/quadruple** as they are the most common. These groupings of beats are called ***measures*** (*North American English*) or ***bars*** (*British English*) and are shown on sheet music with thin lines to divide the measures.



Each measure has the same amount of beats. **Bar line** is vertical bar that ***separates each measure on a musical staff***. A **double bar lines** are two vertical lines used to ***separate different music sections*** or ***to mark the end of a piece of music***.



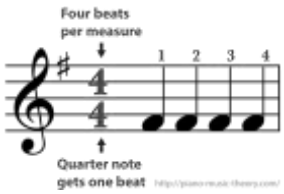
The Common Time Signature

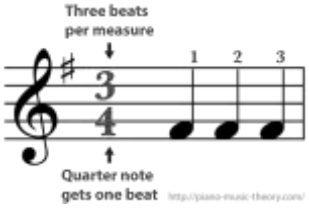
4/4 Time Signature is also called the ***common time***, because it is the most common time signature in modern music.

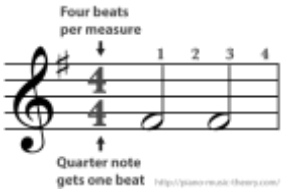
The top number determines how many beats there are per measure. The bottom number tells what kind of note gets the beat. In this example, 4/4 time, there are 4 beats per measure, and the quarter note (bottom 4) gets the beat. In 3/4 time, the quarter note would still get the beat, but there would only be 3 beats in a measure. In 6/8 time, the eighth note gets the beat, and there are 6 beats to a measure.

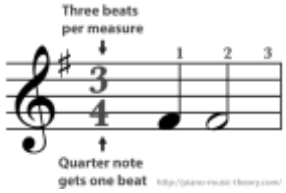
The ***pulse*** **(*meter*)** is the driving beat in music that we march, feel, dance, clap and conduct to. First find the beat that seems the strongest, then try tapping along to it. Eventually you should be able to tap along with the music, and you will have found the pulse. Listen to the bass line and the rhythm section, as often they play with the pulse.

4/4 Time Signature	3/4 Time Signature
Top number: Four beats per measure.	Three beats per measure.
Bottom number: Quarter note gets one beat.	Quarter note gets one beat.

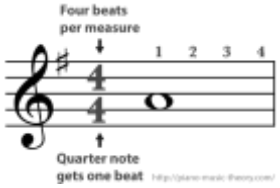


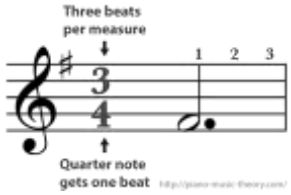




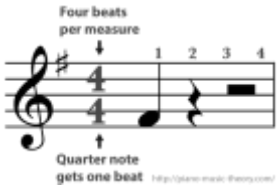


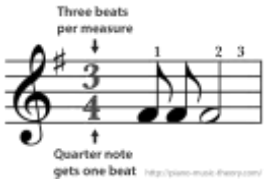
A half note gets two beats. A half note gets two beats.





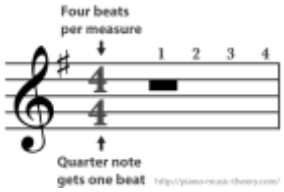
A whole note gets four beats. A dotted half note gets three beats.

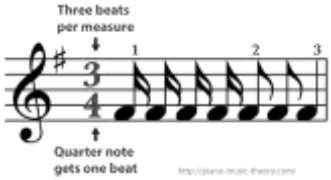




A quarter rest gets one beat and a half rest gets two beats.

An eighth note gets half a beat.





A whole rest gets four beats. A sixteenth note gets a quarter of a beat.

(It takes two eighth notes or four sixteenth notes to get one beat.)

Introduction to Rhythm & Tempo

Rhythm is a general term used to describe the motion of music in time. The fundamental unit of rhythm is the ***pulse*** or ***beat***. Even a person untrained in music generally senses the pulse and might tap their foot or clap their hands.

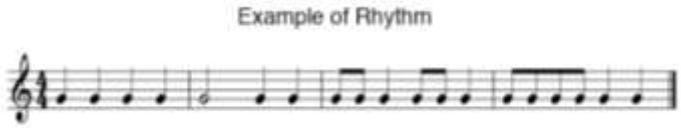
Tempo is defined as the speed of a song. It is ***measured in beats per minute***. A very ***fast tempo*** has about 200–208 beats per minute. A ***moderate tempo*** has about 108-120 beats per minute. ***Very slow tempo*** has 40–60 beats per minute.

The meter of a piece of music is expressed by the ***arrangement of rhythms***—as in repetitive patterns of strong and/or weak beats. This does not necessarily mean that the rhythms themselves are repetitive, but they do strongly suggest a repeated pattern of pulses. It is on these pulses, the beat of the music, that you tap your foot, clap your hands, dance, *etc*.

Some music does not have a ***meter***. Ancient music, such as ***Gregorian chants***; new music, such as some experimental 20th-century "art music"; and non-Western music, such as some ***native American flute music***, may not have a strong, repetitive pattern of beats. Other types of music, such as ***traditional Western African drumming***, may have very complex meters that can be difficult for the beginner to identify.

But ***most Western music has simple, repetitive patterns of beats***. This makes meter a very useful way to organize the music. Common

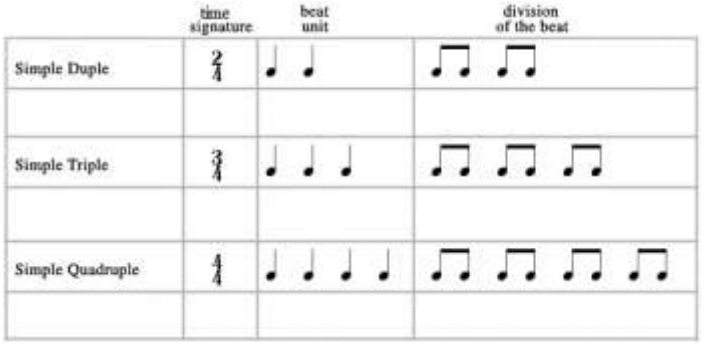
notation, *for example*, divides the written music into small groups of beats called ***measures***, or ***bars***. The lines dividing each measure from the next help the musician reading the music to keep track of the rhythms. A piece (or section of the piece) is assigned ***a time signature*** that tells the performer how many beats to expect in each measure, and what type of note should get one beat.

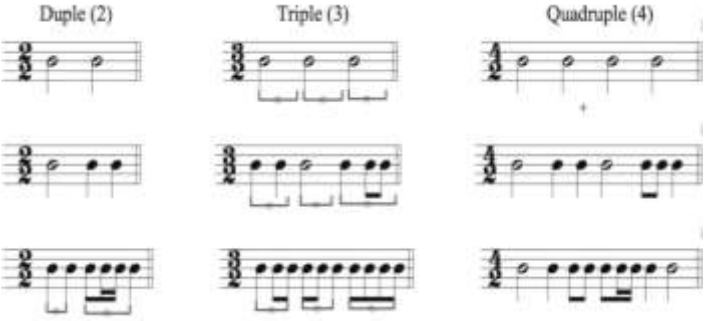


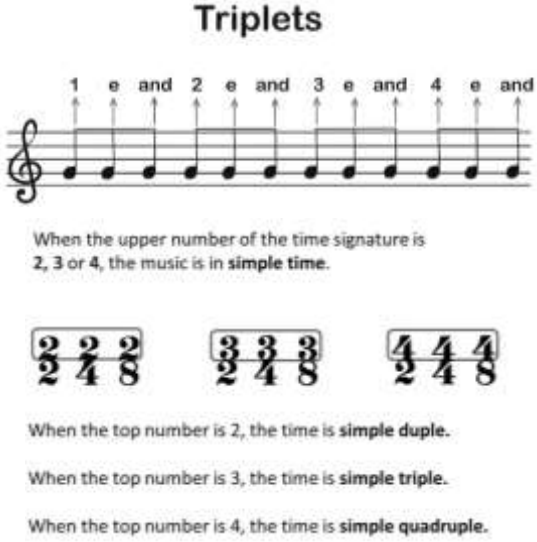
Classifying Meters

Meters can be classified by ***counting the number of beats from one strong beat to the next***. For example, if the meter of the music feels like "strong-weak-strong-weak"—it is *probably* in ***duple meter***—"strong-weak-weak-strong-weak-weak" is ***triple meter***, and "strong-weak-weak-weak" is ***quadruple***. (Most people don't bother classifying the more unusual meters, such as those with five beats in a measure.)

Meters can also be classified as either simple or compound. In a ***simple meter***, each beat is *basically* divided into ***halves***. In ***compound meters***, each beat is divided into ***thirds***.

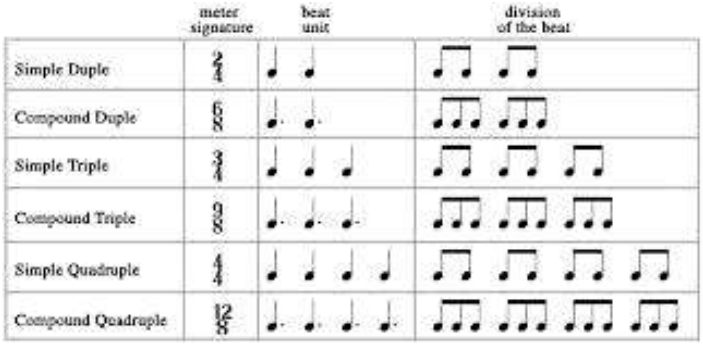






A ***borrowed division*** occurs whenever the basic meter of a piece is interrupted by some beats that sound like they are "borrowed" from a different meter. One of the most common examples of this is the ***use of triplets*** to add some compound meter to a piece that is mostly in a simple meter.

Recognizing Meters



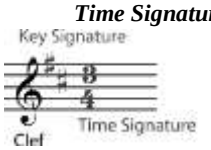
To learn to recognize meter, remember that (in most Western music) the ***beats*** and the ***subdivisions of beats*** are all equal and even. So you are *basically* listening for ***a smooth running, even pulse underlying the rhythms*** of the music. For example, if it makes sense to count along with the music "ONE-and-Two-and-ONE-and-Two-and" (with all the syllables very evenly spaced) then you *probably* have a ***simple duple meter***. But if it's more comfortable to count "ONE-and-a-Two-and-a-ONE-and-a-Two-and-a" —it's *probably* ***compound duple meter***. (Make sure numbers always come on a pulse, and "one" always on the strongest pulse.)

Meter	Count											Example Time Signature
Duple Simple	1	&	2	&								2/4
Triple Simple	1	&	2	&	3	&						3/4
Quadruple Simple	1	&	2	&	3	&	4	&				4/4
Duple Compound	1	&	a	2	&	a						6/8
Triple Compound	1	&	a	2	&	a	3	&	a			9/8
Quadruple Compound	1	&	a	2	&	a	3	&	a	4	&	a	12/8

Remember that meter is not the same as time signature; the time signatures given here are just examples. For example, 2/2 and 2/8 are also simple duple meters.

This may take some practice if you're not used to it, but it can be useful practice for anyone who is learning about music. To help you get started, the figure below sums up the most-used meters. To help give you an idea of what each meter should feel like, here are some animations (with sound) of duple simple, duple compound, triple simple, triple compound, quadruple simple, and quadruple compound meters. You may also want to listen to some examples of music that is in simple duple, simple triple, simple quadruple, compound duple, compound triple meters and compound quadruple.

Time Signature

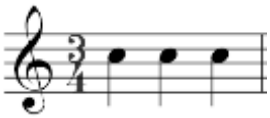


The **time signature** appears ***at the beginning of a piece of music, right after the clef symbol and the key signature***. Unlike the key signature, which is on every staff, the time signature will not appear again in the music unless the meter changes. The ***meter*** of a piece of music is its ***basic rhythm***; the ***time signature*** is the symbol that tells you the meter of the piece and how (with what type of note) it is written.

Time signature (*q.v.*) on a musical staff defines how many beats in a measure (top number) and the note type that gets one beat (bottom

number). The time signature is written at the beginning of a staff after the key signatures.

For instance:

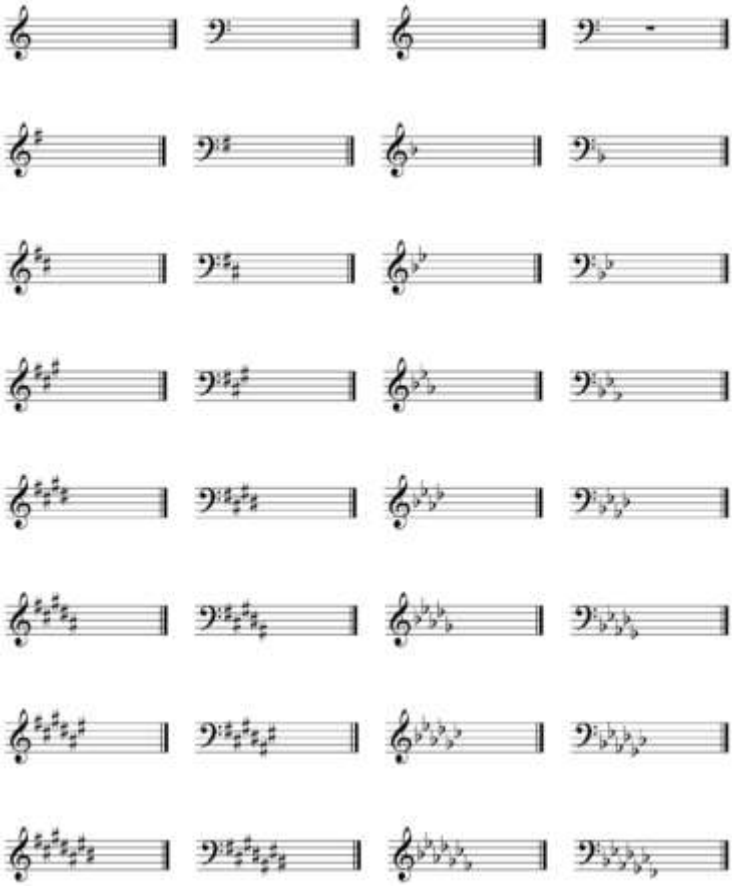


The upper number indicates the number of beats per measure, and the lower digit indicates which note gets the beat (2 signifies a half note, 4 refers to a quarter note, 8 for the an either note, *etc*.).

4/4 Time Signature is *also* called **"common time"** because it is the most common time signature in modern music.

Key Signature

A **key signature** shows which pitch classes are to be consistently played sharp or flat throughout the piece. It is placed at the beginning of each line of a score. We have ***eight sharp key signatures*** and ***eight flat key signatures***. *They look like the following*:



The eight sharp key signatures and eight flat key signatures.

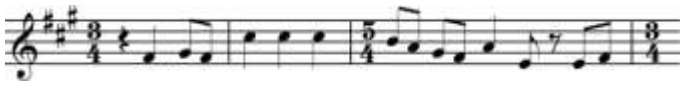
Meter Signatures

Meter can be defined as a regular, recurring pattern of strong and weak beats. This recurring pattern of durations is identified at the beginning of a composition by a meter signature (time signature). This may also change throughout a composition, and is identified at every change.

There is one common exception to this rule: (*There are also some less common exceptions not discussed here*). Often, a piece of music does not begin on the strongest downbeat. Instead, the strong beat that people like to count as "one" (the beginning of a measure), happens on the second or third note, or even later. In this case, the first measure may be a full measure that begins with some rests. But often the first measure is simply not a full measure. This shortened first measure is called a pickup measure.

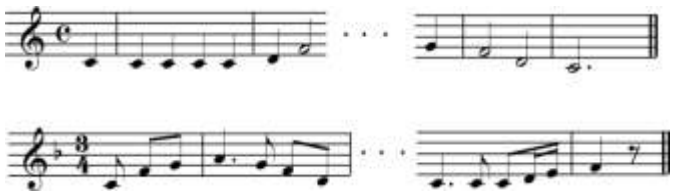
Pickup Measures

Normally, all the measures of a piece of music must have exactly the number of beats indicated in the time signature. The beats may be filled with any combination of notes or rests (with duration values also dictated by the time signature), but they must combine to make exactly the right number of beats. If a measure or group of measures has more or fewer beats, the time signature must change.



Normally, a composer who wants to put more or fewer beats in a measure must change the time signature, as in this example from Mussorgsky's ***Boris Godunov***. [2]

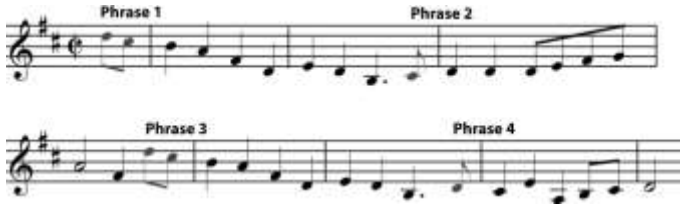
If there is a pickup measure, the final measure of the piece should be shortened by the length of the pickup measure (although this rule is sometimes ignored in less formal written music). For example, if the meter of the piece has four beats, and the pickup measure has one beat, then the final measure should have only three beats. (Of course, any combination of notes and rests can be used, as long as the total in the first and final measures equals one full measure.



If a piece begins with a pickup measure, the final measure of the piece is shortened by the length of the pickup measure.

Pickup Notes

Any phrase of music (not just the first one) may begin someplace other than on a strong downbeat. All the notes before the first strong downbeat of any phrase are the pickup notes to that phrase.



Any phrase may begin with pickup notes. Each of these four phrases begins with one or two pickup notes. (You may listen to the tune here; can you hear that the pickup notes lead to the stronger downbeat?)

A piece that is using pickup measures or pickup notes may also sometimes place a double bar (with or without repeat signs) inside a measure, in order to make it clear which phrase and which section of the music the pickup notes belong to. If this happens (which is a bit rare, because it can be confusing to read), there is still a single bar line where it should be, at the end of the measure.

At the ends of sections of the music, a measure may be interrupted by a double bar that places the pickup notes in the correct section and assures that repeats have the correct number of beats. When this happens, the bar line will still appear at the end of the completed measure. This notation can be confusing, though, and in some music the pickups and repeats are written in a way that avoids these broken-up measures.

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[2] ***Boris Godunov*** (Russian: Борис Годунов) is an opera by **Modest Mussorgsky** (1839–1881). It was the only opera that Mussorgsky finished. It is his most famous work and one of the most famous of all Russian operas. It was composed between 1868 and 1873.

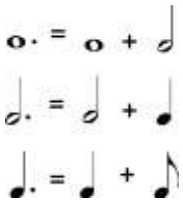
Dots, Ties, and Borrowed Divisions

A half note is half the length of a whole note; a quarter note is half the length of a half note; an eighth note is half the length of a quarter note, and so on (*q.v.*) The same goes for rests. But what if you want a note (or rest) length that isn't half of another note (or rest) length?

Dotted Notes

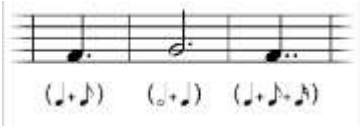
A dot beside a note increases its duration by half its original value. For example, half notes, in 4/4 time, are worth 2 beats. When a dot is placed next to the half note, the duration is increased by one (one being half of the original duration of two) and the resulting duration is three beats. The curved line in the picture above is a tie. Ties connect notes that are the same pitch together to create a sustained note.

One way to get a different length is by dotting the note or rest. A dotted note is one-and-a-half times the length of the same note without the dot. In other words, the note keeps its original length and adds another half of that original length because of the dot. So a dotted half note, for example, would last as long as a half note plus a quarter note, or three quarters of a whole note.



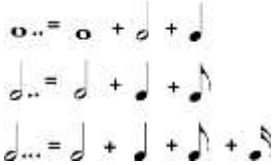
The dot acts as if it is adding another note half the length of the original note. A dotted quarter note, for example, would be the length of a quarter plus an eighth, because an eighth note is half the length of a quarter note.

The tie is a curved line that connects two adjacent notes of the same pitch into a single sound with a duration equal to the sum of both note values. In other words, it will make the note sound longer.



The dot placed to the right of a note head, the dot lengthens the value of the note by half again its value. A second dot (*yes they do that sometimes just to mess with us*) lengthens the dotted value by half the length of the first dot. Dots may also be used with rests and affect them the same way.

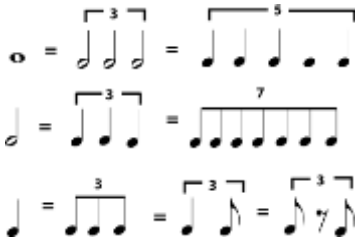
A note may have more than one dot. Each dot adds half the length that the dot before it added. For example, the first dot after a half note adds a quarter note length; the second dot would add an eighth note length.



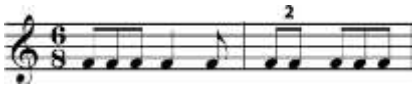
When a note has more than one dot, each dot is worth half of the dot before it.

Borrowed Divisions

Dots and ties give you much freedom to write notes of varying lengths, but so far you must build your notes from halves of other notes. If you want to divide a note length into anything other than halves or halves of halves - if you want to divide a beat into thirds or fifths, for example - you must write the number of the division over the notes. These unusual subdivisions are called borrowed divisions because they sound as if they have been borrowed from a completely different meter. They can be difficult to perform correctly and are avoided in music for beginners. The only one that is commonly used is triplets, which divide a note length into equal thirds.



Any common note length can be divided into an unusual number of equal-length notes and rests, for example by dividing a whole note into three instead of two "half" notes. The notes are labeled with the appropriate number. If there might be any question as to which notes are involved in the borrowed division, a bracket is placed above them. Triplets are by far the most common borrowed division.



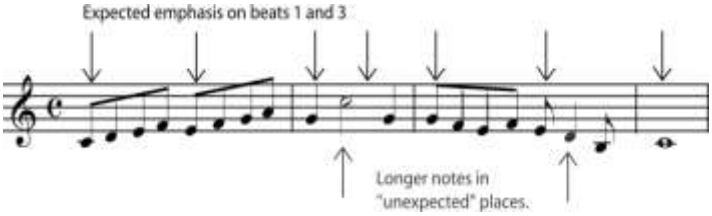
In a compound meter, which normally divides a beat into three, the borrowed division may divide the beat into two, as in a simple meter. You may also see duplets in swing music.

Notes in jazzy-sounding music that has a "swing" beat are often assumed to be triplet rhythms, even when they look like regular divisions; for example, two written eighth notes (or a dotted quarter-sixteenth) might sound like a triplet quarter-eighth rhythm. In jazz and other popular music styles, a tempo notation that says swing usually means that all rhythms should be played as triplets. Straight means to play the rhythms as written.

Some jazz musicians prefer to think of a swing rhythm as more of a heavy accent on the second eighth, rather than as a triplet rhythm, particularly when the tempo is fast. This distinction is not important for students of music theory, but jazz students will want to work hard on using both rhythm and articulation to produce a convincing "swing".

Syncopation

A syncopation or syncopated rhythm is any rhythm that puts an emphasis on a beat, or a subdivision of a beat, that is not usually emphasized. One of the most obvious features of Western music, to be heard in most everything from Bach to blues, is a strong, steady beat that can easily be grouped evenly into measures. (In other words, each measure has the same number of beats, and you can hear the measures in the music because the first beat of the measure is the strongest. See Time Signature and Meter for more on this.) This makes it easy for you to dance or clap your hands to the music. But music that follows the same rhythmic pattern all the time can get pretty boring. Syncopation is one way to liven things up. The music can suddenly emphasize the weaker beats of the measure, or it can even emphasize notes that are not on the beat at all.

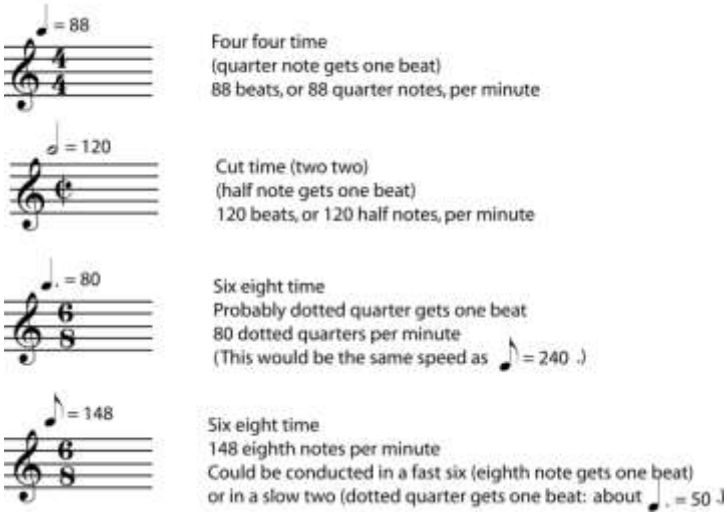


A syncopation may involve putting an "important" note on a weak beat, or off the beat altogether.

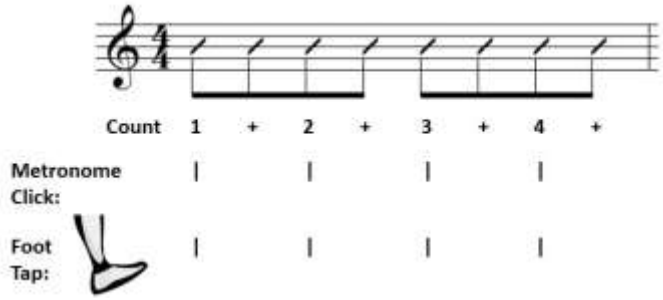
Metronome Markings

Metronome markings are given in beats per minute. They can be estimated using a clock with a second hand, but the easiest way to find them is with a metronome, which is a tool that can give a beat-per-minute

tempo as a clicking sound or a pulse of light. Figure 1.83 shows some examples of metronome markings.



Metronomes often come with other tempo indications written on them, but this is misleading. For example, a metronome may have ***allegro*** marked at ***120 beats per minute*** and ***andante*** marked at ***80 beats per minute***. Allegro should certainly be quite a bit faster than andante, but *it* may not be exactly 120 beats per minute.



A tempo marking that is a word or phrase gives you the composer's idea of how fast the music should feel. How fast a piece of music feels depends on several different things, including the texture and complexity of the music, how often the beat gets divided into faster notes, and how fast the beats themselves are (the metronome marking). Also, the same tempo marking can mean quite different things to different composers; if a metronome marking is not available, the performer should use a knowledge of the music's style and genre, and musical common sense, to decide on the proper tempo. When possible, listening to a professional play the piece can help with tempo decisions, but it is also reasonable for different performers to prefer slightly different tempos for the same piece.

Traditionally, tempo instructions are given in Italian.

Some Common Tempo Markings

Grave - very slow and
Largo - slow and broad
Larghetto - not quite as slow as largo
Adagio - slow
Lento - slow
Andante - literally "walking", a medium slow tempo
Moderato - moderate, or medium Allegretto - Not as fast as allegro
Allegro - fast
Vivo, or ***Vivace*** - lively and brisk
Presto - very fast
Prestissimo - very, very fast

These terms, along with a little more Italian, will help you decipher most tempo instructions.

Of course, tempo instructions don't have to be given in Italian. Much folk, popular, and modern music, gives instructions in English or in the composer's language. Tempo indications such as "Not too fast", "With energy", "Calmly", or "March tempo" give a good idea of how fast the music should feel.

If the tempo of a piece of music suddenly changes into a completely different tempo, there will be a new tempo given, usually marked in the same way (metronome tempo, Italian term, etc.) as the original tempo. Gradual changes in the basic tempo are also common in music, though, and these have their own set of terms. These terms often appear below the staff, although writing them above the staff is also allowed. These terms can also appear with modifiers like molto or un poco. You may notice that there are quite a few terms for slowing down. Again, the use of these terms will vary from one composer to the next; unless beginning and ending tempo markings are included, the performer must simply use good musical judgment to decide how much to slow down in a particular ritardando or rallentando.

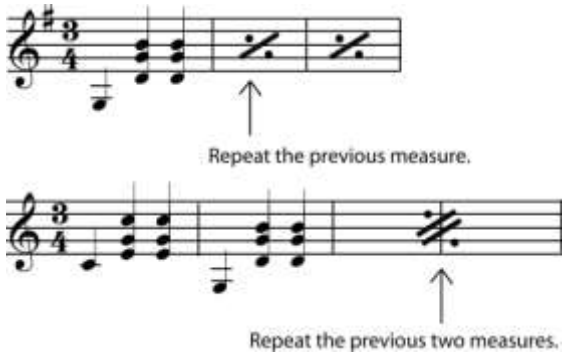
Repeats and Other Musical Road Map Signs

Repetition, either exact or with small or large variations, is one of the basic organizing principles of music. Repeated notes, motifs, phrases, melodies, rhythms, chord progressions, and even entire repeated sections in the overall form, are all very crucial in helping the listener make sense of the music. So good music is surprisingly repetitive!

So, in order to save time, ink, and page turns, common notation has many ways to show that a part of the music should be repeated exactly.

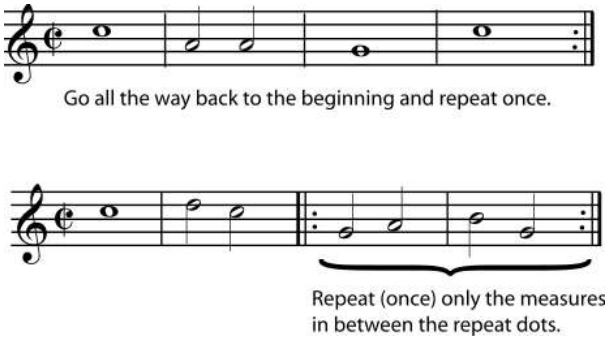
If the repeated part is very small - only one or two measures, for example - the repeat sign will probably look something like those in Figure 1.84. If you have very many such repeated measures in a row, you may want to number them (in pencil) to help you keep track of where you are in the music.

Figure 1.84. Repeated Measures



For repeated sections of medium length - usually four to thirty-two measures - repeat dots with or without endings are the most common markings. Dots to the right of a double bar line begin the repeated section; dots to the left of a double bar line end it. If there are no beginning repeat dots, you should go all the way back to the beginning of the music and repeat from there.

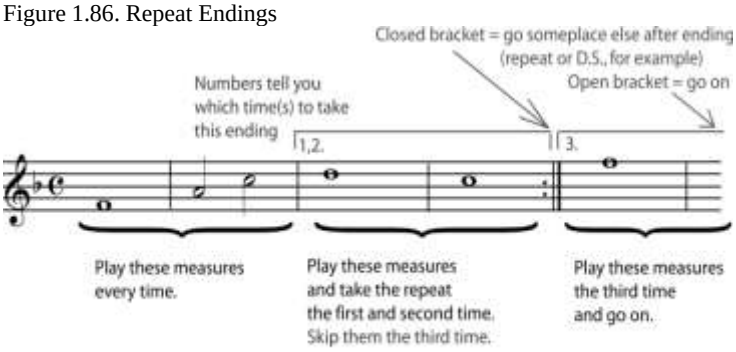
Figure 1.85. Repeat Dots



If there are no extra instructions, a repeated section should be played twice. Occasionally you will see extra instructions over the repeat dots, for example to play the section "3x" (three times).

It is very common for longer repeated sections of music to be repeated exactly until the last few measures. When this happens, the repeat dots will be put in an ending. The bracket over the music shows you which measures to play each time you arrive at that point in the music. For example, the second time you reach a set of endings, you will skip the music in all the other endings; play only the measures in the second ending, and then do whatever the second ending directs you to do (repeat, go on, skip to somewhere else, etc.).

Figure 1.86. Repeat Endings



Some "endings" of a section of music may include a repeat, while others do not. Play only one ending each time (skipping over other, previously played endings when necessary), and then follow the "instructions" at the end of the ending (to repeat, go on, go someplace else, etc.).

When you are repeating large sections in more informally written music, you may simply find instructions in the music such as "to refrain", "to bridge", "to verses", etc. Or you may find extra instructions to play certain parts "only on the repeat". Usually these instructions are reasonably clear, although you may need to study the music for a minute to get the "road map" clear in your mind. Penciled-in markings can be a big help if it's difficult to spot the place you need to skip to. In order to help clarify things, repeat dots and other repeat instructions are almost always marked by a double bar line.

In Western classical music, the most common instructions for repeating large sections are traditionally written (or abbreviated) in Italian. The most common instructions from that tradition are in Figure 1.87.

Figure 1.87. Other Common "Road Map" Signs

D.C. or *da capo*	"To the head" - Go back to the very beginning
D.S. or *dal segno*	"To the sign" - Go back to the sign
al fine	"To the end" - On the repeat, stop when it says "*fine*"
𝄋	Sign
fine	"End" - On the last time through, stop here
to ⊕	Go to the coda section
⊕	Coda section

Articulation

Staccato - Means to play the note very short and detached.

Accent - Means to hit the note harder and louder.

Marcato - Almost a combination of staccato and accent, provides a sharp sound.

Tenuto - Hold the note for its full value.

Sforzando - A sudden, strong accent.

Fermata - Hold the note longer, approximately half again as long (1.5x), or until conducted to stop.

Dynamics

pp This symbol is pianissimo, it means play very softly.

p This symbol is piano, it means play softly.

mp This symbol is mezzo piano, it means play moderately soft.

mf This symbol is mezzo forte, it means play moderately loud.

f This symbol is forte, it means play loudly.

ff This symbol is fortissimo, it means play very loudly.

< Also abbreviated Cresc. or written in as crescendo. This sign is the crescendo sign, it means gradually become louder.

> Also abbreviated as Decresc. or written as decrescendo, dim., or diminuendo. This sign is decrescendo, it means gradually become softer.

Repeats

These are the begin and end repeat signs. When you reach the second, go back to the first and repeat the music. These are often accompanied by first, second and even third endings.

D.S.

This is a directional marking. It means 'Del Signo'. When you see this in music, you must go to the sign (below). This marking may also be accompanied by 'al coda' or 'al fine'. These mean 'Go to the sign, from there go to the coda' and 'Go to the sign, from there go to the end' respectively. Essentially these are big repeat signs.

𝄋

This is the sign. From here you play to the coda or the end or wherever the Dal Segno directs you.

⊕

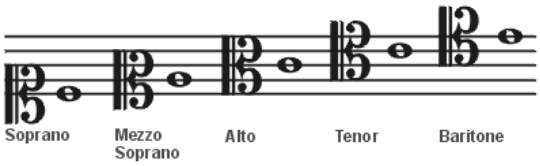
This is the coda sign. It marks when to go to the special ending, or coda. Usually you won't go to the coda until after a D.S. al coda.

The Voice

Alessandro Moreschi (1858-1922) Catharina "Nina" Hagen

Alessandro Moreschi was the most famous castrato singer of the late-19th century and the only castrato of the classic *bel canto* tradition to make solo recordings.

Catharina "Nina" Hagen is a German singer, songwriter, and actress. She is known for her theatrical vocals and rose to prominence during the punk and new wave movements in the late 1970s and early 1980s.



The Piano

SIGNS/ SYMBOLS	TERMS	MEANING
p	Piano	Soft
mp	Mezzo Piano	Moderately Soft
pp	Pianissimo	Very Soft
f	Forte	Loud
mf	Mezzo Forte	Moderately Loud
ff	Fortissimo	Very Loud
<	Crescendo (cresc.)	Gradually getting louder.
>	Decrescendo or Diminuendo (dim.)	Gradually getting softer.

Have you ever wondered where the name "piano" came from? It's actually a shortened version of "pianoforte". This type of keyboard got this name because it had something that earlier types of keyboard (and some of the later ones, such as the first synthesizers and electric keyboards) had: touch sensitive keys that could play loud and quiet. Up until that time, all the keyboard instruments such as the harpsichord and the spinet – and the pipe organ! – could only play one volume. The piano, with all its subtlety, was revolutionary!

But why call it the pianoforte? This is because "pianoforte" comes from two Italian words: piano, meaning "soft, quiet or gentle" and "forte" meaning "strong, loud and forceful". These words are just some you will encounter when you start learning how to read music. You'll encounter these and have to learn these, as they're kind of like road signs telling you how a piece should be played. There's much more to learning how to read music for playing the piano than just learning which line or space in the stave corresponds to which note.

Here is a quick list of some of the most common terms that typical piano players will encounter in sheet music, along with what they mean.

Piano: Abbreviated **p.** This means you play quietly. You can go quieter to pianissimo (pp) or even ppp. If the music tells you to play ppp, then your fingers should barely touch the keys and the sound should be a mere whisper.

Forte: Abbreviated **f.** This means you play firmly and loudly. Fortissimo (ff) is louder and fff is louder still. If you're in a rotten mood and want to release the emotion on the piano, look for a piece that has lots of ff in it. There's another variation, and that's sf, which means suddenly and strongly loud for one or two notes. Another good thing to play for stress relief.

Da Capo (or D.C.): "Take it again from the top." That's all it means and is a lot quicker to write.

Da Signo (D.S.): This means "go back to the sign". This is kind of annoying, as you then have to look back through the music you've already played to find a sort of abused dollar sign thing. That's your sign to go back to and repeat from.

Al fine: Usually found after D.C. or D.S. and it means "to the end."

Crescendo: This means "getting louder" or "growing". It does not mean "most dramatic part or climax". It's the build-up to a climax and you can put your dirty mind away right now – bet you never thought that playing the piano was a sexy as that. It's sometimes shown with a symbol that's something like this: <.

Decrescendo: The opposite of a crescendo, this means you should get gradually quieter or die away – like fading out at the end of a song. The symbol for this is >.

Capo 3: You have picked up a piece of music that has the chords written over it for a guitarist who has put a capo on the guitar so they don't have to play bar chords for the whole piece. This means that if you are using the guitar chords at the top of the music to give you the left-hand harmony rather than reading the music on the bass stave, you will have to take care. If you are lucky, there will be two sets of chords written.

A little note plus an equals sign and a number in the top left corner above the music: This tells you how many beats per minute the tempo of the song should have. If you are playing an electric piano or keyboard that allows you to set the drumbeat, you're in luck, as you can just set the beat to this pace. If you don't have an electric piano with a beat bank, you can use a metronome to set the tempo. If you have neither, then anything 70 or below is played quite slowly. Between 80 and 100 is medium pace; anything over 100 is quite quick.

Staccato: Short and sharp – make your fingers bounce off the keys. This is sometimes also shown by little dots on top of the notes to be played (not after them – that's another story).

Ritardando (rit.) or rallentando (ral.): These mean "slowing down" and you'll usually find them right at the end of a piece. If they aren't at the very end of a piece, watch out for the sign "a tempo", which means go back to your normal speed.

Table 3: Classical Poetic Metre

	metrical foot	poetic syllables	musical notation	groups of beats	equivalent time signatures
duple	dactyl	— ◡ ◡	♩ ♫	2 + 2	2/4
duple	anapest	◡ ◡ —	♫ |♩	2 + 2	2/4
triple	trochee	— ◡	♩ ♪	2 + 1	3/8
triple	iamb	◡ —	♪ |♩	1 + 2	3/8